REMARKS

Claims 20-24 are in the application. No claim is allowed.

Claims 20-22 and 24 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Antal, Jr. et al. ("Antal"), reference H, in view of Bergman, reference N. This rejection is respectfully traversed. Reconsideration and withdrawal are respectfully requested in view of the following.

Claim 20 has now been amended to recite that the reactor comprises a heater at the distal end to ignite the biomass material within the canister such that the biomass is ignitable to form a flame front only by heating with the heater at the distal end. The structural relationship between the heater at the distal end and the valve air entry orifice at the proximal end is recited such that they are disposed to form a directional draft within the reactor wherein the air flows through the biomass material toward the distal end and the flame front, initially ignited at the distal end, moves through the biomass material toward the proximal end. This is supported at page 6, lines 30-31 and page 5, line 9.

With the multiple heaters in Antal, one each located at the distal and proximal ends and two located between the ends, activation of the heaters would cause ignition at several locations within the biomass, forming several flame fronts. This would defeat the entire mode of operation of the present reactor, which requires generation of only a single flame front at the distal end, fed by air inflow at the proximal end. Moreover, there is no teaching in Antal to disable all but one of the heaters, and if so, which one should be used to ignite the biomass. Accordingly, the presently claimed reactor is structurally distinguished from that disclosed in Antal.

The examiner cites Bergman to show insulation on the canister, but Bergman does not remedy the above deficiencies of Antal. Bergman teaches the input of a compressed inert gas from the same end where the heating elements 13 are located. So even if air is used instead of inert gas, it is flowing from the same end as the flame, contrary to the mode of operation of the present invention. Accordingly, Bergman does not remedy the deficiencies discussed above in Antal.

The advantages of having a single flame front traveling in a directional draft mode with air intake from the opposite end provides an advantage not afforded by the Antal reactor. The residence time in the presently claimed reactor is approximately 30 minutes, rather than the several hours (Antal, Table 1) for wet biomass. According to Table 1 in Antal, heating times less than an hour were only obtained when the biomass was predried (1.5% moisture content for Leucaena wood).

According to the present invention the biomass need not be dried at all to use heating times of less than an hour. According to these different structural features and the advantages obtained thereby, it is submitted that the present claims are unobvious over the combination of Antal and Bergman and withdrawal of the rejection is respectfully requested.

Claim 23 is rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Antal (reference H) in view of Bergman (reference N), further in view of Koppelman (reference A). The examiner relies on Antal and Bergman as indicated above. Koppelman is added to apparently show the feature of the present reactor of an air entry tube passing through the distal end of the housing and the bed of biomass material and having an opening at the proximal end of the bed. The examiner cites Koppelman to teach that pre-heating the *inert gas* feed results in a reduction of overall operation time, on the assumption that the reason Applicant's air entry tube passes through the bed is to pre-heat the air from the heat of the bed as it passes into the reactor.

This rejection is respectfully traversed. Koppelman is irrelevant to the present claim. Firstly, Applicant does not input inert gas, as do Antal and Koppelman. Secondly, the reason stand pipe 29 is used in Applicant's reactor is not to preheat incoming air. When the reactor is first pressurized, incoming air enters the reactor before there is any ignition. See page 6, lines 9-11. Therefore, pre-heating of incoming air cannot possibly occur. Similarly, there can be no significant preheating of the air entering through stand pipe 29 until the bed is substantially ignited. The primary purpose of stand pipe 29 is to deliver the incoming air to the end opposite from the heater so that the above-described downdraft may occur. . None of the three references discloses the recognition of the employment of entry of the air opposite to the end of where ignition only occurs to create a directional draft to attain desirable or advantageous features. Accordingly, it is respectfully submitted that claim 23 is unobvious over the combination of Antal, Bergman and Koppelman, for the reasons previously given. Withdrawal of this rejection is requested.

It is submitted that upon entry of this amendment, this application is in condition for allowance.

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